AMENDMENT NO. 1

CONTRACT FOR PROFESSIONAL SERVICES
ENGINEERING REPORT PHASE
Evaluation of Pease WWTF SBRs – Loading Scenarios
Portsmouth, New Hampshire

WHEREAS, a Contract was entered into on the 30th day of **September 2016** by and between the City of Portsmouth, New Hampshire, hereinafter called the OWNER, and Underwood Engineers, Inc., hereinafter called the ENGINEER, for engineering work required to provide an evaluation of the Pease WWTF – Loading Scenarios (Engineering Report Phase) as further identified as **Purchase Order No 17000277**,

WHEREAS,

Additional Engineering Services are needed see Attachment A.

NOW, THEREFORE, in consideration of the agreement an amendment is hereby agreed to by the OWNER and the ENGINEER as follows:

A. That the dollar amount in the ENGINEERING FEE ESTIMATE on page 3 be amended to read:

Task 1 – Three Loading Scenarios	$10,900
Task 2 – Meetings	$3,500
Task 3 – Additional Evaluations	**$8,000**
Task 4 – Sampling Program	**$6,000**
Total	**$28,400**

[Prior fee = $ 14.400; Increase = $ 14,000.00 Revised = $28,400.00]

The OWNER and the ENGINEER hereby agree to this Amendment.

City or Portsmouth, New Hampshire
(Owner)

Date: 1-16-18

By: John P. Bohenko
John P. Bohenko, City Manager

Underwood Engineers, Inc.
(Engineer)

Date: Jan 8, 2018

By: W. Steven Clifton
W. Steven Clifton, P.E., Vice President

ATTACHMENT "A"

AMENDMENT No. 1
Engineering Report Phase
Evaluation of Pease WWTF SBRs – Loading Scenarios

BACKGROUND/PURPOSE

The City of Portsmouth's Department of Public Works requests additional Professional Engineering Services to evaluate the capacity of the Pease WWTF Sequencing Batch Reactors. The City requests additional modeling evaluations and assistance in performing a sampling program to address the January 27, 2017 Industrial Wastewater Indirect Discharge Approval from NHDES. These evaluations are required to support the proposed expansion of facilities at the Lonza Biologics, Inc. facility located at the Pease International Tradeport.

Therefore, the following additional services will be provided

Task 3 – Additional Evaluations

Additional evaluations to be evaluated are as follows:

1 Existing conditions with historical IUP allocations
2 Existing conditions with permitted or proposed IUP allocations
3 Future conditions assuming a 5- year buildout of commercial and permitted IUP allocations

In order to accomplish the evaluation of scenarios 1, 2 and 3, the major industrial user end of pipe data will be assessed and be a separate input to the model used in the evaluation. Estimates will be provided of the aeration requirements, the amount of sludge to waste, the recommended SRT and the aeration diffuser and aeration blower requirements. Specifically, two new blowers (one on standby) and two new aeration racks in each tank will be used to determine if aeration requirements will be met. Effluent quality will be estimated using BioWin to determine conformance with the 30/45/50 mg/L BOD permit limits.

A spreadsheet previously created will be updated to meet the City's needs.

Task 4 – Sampling Program

The January 27, 2017 Industrial Wastewater Indirect Discharge Approval from NHDES requires certain Special Conditions be met. Once Lonza is in nominal production in both the new production process and the baseline processes, the City is required to have Lonza and Redhook Brewery perform fourteen consecutive days of flow proportioned composite sampling of their end of pipe discharge for BOD_5.

Previous work performed by Underwood Engineers provided documentation of a discrepancy of the influent concentrations measured at the headworks as compared to the amount of sludge dewatered and hauled to the landfill. This discrepancy has a major impact on the estimation of existing loadings from commercial users. We suggest this imbalance be evaluated further.

Influent, septage and primary effluent testing, along with primary sludge wasting volume and concentration can be used to determine a mass balance around the primary clarifiers. The City's two largest industrial dischargers will also be asked to perform sampling during this effort in order to confirm the validity of the influent load to the headworks.

Primary effluent concentrations, waste activated sludge volume and concentrations can be used to estimate the amount of sludge produced per pound of BOD5 or COD removed.

Underwood Engineers will prepare a sampling program for the City to execute. The data will be reviewed, and estimates will be made as to the accuracy of the influent loads and primary and waste activated sludge.

SUMMARY OF DELIVERABLES

- Engineering analysis of actual operational data and modifications of POTW operations to establish new BOD_5 headworks loading limits. These estimates will include the new IDP BOD_5 loading limits along with historical baseline flows.
- Recommendations for any additional aeration modifications in order to achieve the new headworks BOD_5 loading limits.
- Assistance in preparing a sampling program to address the solids imbalance identified during the evaluation of this study.